

OZONE DEPLETION

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The ozone layer is a belt of naturally occurring ozone gas that sits 9.3 to 18.6 miles (15 to 30 kilometers) above Earth and serves as a shield from the harmful ultraviolet B radiation emitted by the sun.

Ozone is a highly reactive molecule that contains three oxygen atoms. It is constantly being formed and broken down in the high atmosphere, 6.2 to 31 miles (10 to 50 kilometers) above Earth, in the region called the stratosphere.

Today, there is widespread concern that the ozone layer is deteriorating due to the release of pollution containing the chemicals chlorine and bromine. Such deterioration allows large amounts of ultraviolet B rays to reach Earth, which can cause skin cancer and cataracts in humans and harm animals as well.

Extra ultraviolet B radiation reaching Earth also inhibits the reproductive cycle of phytoplankton, single-celled organisms such as algae that make up the bottom rung of the food chain. Biologists fear that reductions in phytoplankton populations will in turn lower the populations of other animals. Researchers also have documented changes in the reproductive rates of young fish, shrimp, and crabs as well as frogs and salamanders exposed to excess ultraviolet B.

Chlorofluorocarbons (CFCs), chemicals found mainly in spray aerosols heavily used by industrialized nations for much of the past 50 years, are the primary culprits in ozone layer breakdown. When CFCs reach the upper atmosphere, they are exposed to ultraviolet rays, which cause them to break down into substances that include chlorine. The chlorine reacts with the oxygen atoms in ozone and rips apart the ozone molecule.

One atom of chlorine can destroy more than a hundred thousand ozone molecules, according to the the U.S. Environmental Protection Agency.

The ozone layer above the Antarctic has been particularly impacted by pollution since the mid-1980s. This region's low temperatures speed up the conversion of CFCs to chlorine.

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